

Claims

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1. A discrete, preassembled, composite modular block, comprising:
 - a. an outer wall and an inner wall, at least one of which is load bearing and made from a first material;
 - b. a connective structure formed of a second material different from the first material and connected between the outer wall and the inner wall, said connective structure comprising two or more discrete connective struts, each strut extending between and being connected to both the outer wall and the inner wall, such that the outer wall and the inner wall are securely positioned with respect to one another as opposite faces of a discrete rectangular block.
 2. The block of claim 1 wherein each of the connective struts further comprises a wall connector at each of its ends to connect the connective strut to the outer wall and the inner wall independent of any other blocks.
 3. The block of claim 2 wherein at least one wall connector comprises an elongated connector for insertion in an elongated groove in one of the outer wall and the inner wall.
 4. The block of claim 3, wherein the elongated groove extends substantially vertically when the block is in its normal position in use.
 5. The block of claim 2, wherein the wall connector is a compressible insert-type connector.
 6. The block of claim 5, wherein said insert-type connector further comprises a V-shaped structure with legs compressible toward each other for frictional engagement with a groove formed on an inside surface of the outer wall or the inner wall.

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7. The block of claim 6 wherein the V-shaped structure further comprises at least one rib-like formation integrally formed on the V-shaped structure to frictionally engage an adjacent wall upon insertion in a groove.
8. The block of claim 6 wherein the V-shaped structure further comprises at least one compression-limiting projection on the interior of the V-shaped structure.
9. The block of claim 2 wherein at least one connective strut has a wall connector in an elongated groove in each of the inner and outer walls and said connective strut is positioned substantially flush with the top of the outer wall and the inner wall.
10. The block of claim 1 wherein at least one connective strut further comprises a first member and a second member with edges joined substantially at right angles to form an elongated strut.
11. The block of claim 10 wherein the connective strut further comprises a third member, the third member joined with the first and second to form a strut with a channel-shaped cross-section.
12. The block of claim 1, wherein at least one connective strut is formed from one or more of the group consisting of a plastic, a metal or a metal alloy.
13. The block of claim 1 wherein the connective structure is comprised of one or more of the group consisting of ABS plastic, polypropylene, polyethylene, rigid polymers, fiberglass, or molded fiberglass.
14. The block of claim 1 wherein the connective structure has low energy conductance.
15. The block of claim 14 wherein the connective structure is comprised of one or more of ABS plastic, polypropylene, polyethylene, rigid polymers, fiberglass, or molded fiberglass.

16. The block of claim 1 wherein at least one connective strut further comprises at least one recess for receiving a structural enhancement.
17. A prefabricated load-bearing wall comprising a outer wall and a inner wall formed from a plurality of stacked composite blocks wherein at least one of the outer wall and the inner wall is load bearing and made of a first material, each composite block having its own outer wall and the inner wall and being connected by a connective structure formed of a second material, said connective structure comprising at least two discrete connective struts, each strut extending between and being connected to both the outer wall and the inner wall of a block, such that the outer wall and the inner wall of each block are securely positioned with respect to one another as opposite faces of a discrete rectangular block.
18. The prefabricated wall of claim 17 wherein the plurality of stacked composite blocks are fixedly connected by a material selected from the group consisting of mortar, cement, glue or an adhesive agent.
19. The prefabricated wall of claim 17 further comprising at least one structural enhancement included in the load bearing wall to provide structural support.
20. The prefabricated wall of claim 19 wherein the structural enhancement is a tendon under tension threaded around the connective structure of the plurality of blocks.
21. The prefabricated wall of claim 19 wherein the structural enhancement is a bar.
22. The prefabricated wall of claim 19 wherein the structural enhancement has a first end and a second end, the first end fixedly attached to an anchor at one end of the load bearing wall, the

second end fixedly attached to an anchor at an opposed end of the load bearing wall, the structural enhancement applying compression between the opposed ends.

23. The prefabricated wall of claim 17 further comprising a panel member for insertion between the inner wall and the outer wall of two or more stacked blocks, the panel member comprising a generally planar surface with a mating member at one end for mating attachment of the panel member to the connective structure in parallel orientation to the inner and outer walls.
24. The prefabricated wall of claim 23 wherein the panel member further comprises an insert for substantially sealing said panel member against flow of material from one side of the panel member to the other side.
25. The prefabricated wall of claim 23 wherein the panel member is of a size and shape so that when multiple panel members are inserted into adjacent blocks in a prefabricated wall, the panel members form a substantially continuous sealing surface between the outer wall and the inner wall to prevent flow of material from one side of the panel members to the other side.
26. A method for forming a preassembled wall unit, the method comprising:
 - a. providing a plurality of discrete, composite, modular blocks, each having an inner wall and an outer wall, at least one of which is load bearing and made from a first material;
 - b. providing a connective structure formed of a second material different from the first material and connected between the outer wall and the inner wall of each block, said connective structure comprising two or more discrete connective struts, each strut extending between and being connected to both the outer wall and the inner wall, such

that the outer wall and the inner wall are securely positioned with respect to one another as opposite faces of a discrete rectangular block;

- c. joining at least two of the plurality of blocks to one another in a course or a stack.
 - 27. The method of claim 26 wherein joining the blocks further comprises using mortar.
 - 28. The method of claim 26 wherein joining the blocks further comprises using a tension system to exert a compressive force between the top and bottom of the wall unit.
 - 29. The method of claim 26 further comprising:
 - a. inserting at least two substantially parallel transverse panel members to extend between the inner and outer walls of at least two adjacent blocks; and
 - b. filling the space between the two transverse panel members with concrete to form an internal column within such at least two adjacent blocks.
 - 30. The method of claim 29 further comprising inserting rebar in the concrete.
 - 31. A connective structure for use in a discrete, preassembled, composite modular block, comprising an outer wall and an inner wall, at least one of which is load bearing and made from a first material, said connective structure comprising two or more discrete connective struts, each strut extending between and being connected to both the outer wall and the inner wall, such that the outer wall and the inner wall are securely positioned with respect to one another as opposite faces of a discrete rectangular block, each connective strut being formed of a second material different from the first material.
 - 32. The connective structure of claim 31 wherein each of the connective struts further comprises a wall connector at each of its ends to connect the connective strut to the outer wall and the inner wall.

33. The connective structure of claim 32 wherein at least one wall connector comprises an elongated connector for insertion in an elongated groove in one of the outer wall and the inner wall.
34. The connective structure of claim 33, wherein the elongated groove and inserted elongated connector extends substantially vertically when the block is in its normal position in use.
35. The connective structure of claim 32, wherein the wall connector is a compressible insert-type connector.
36. The connective structure of claim 35, wherein said insert-type connector further comprises a V-shaped structure with legs compressible toward each other for frictional engagement with a groove formed on an inside surface of the outer wall or the inner wall.
36. The connective structure of claim 36 wherein the V-shaped structure further comprises at least one rib-like formation integrally formed on the V-shaped structure to frictionally engage an adjacent wall upon insertion in a groove.
37. The connective structure of claim 36 wherein the V-shaped structure further comprises at least one compression-limiting projection on the interior of the V-shaped structure.
38. The connective structure of claim 32 wherein at least one connective strut has a wall connector for insertion in an elongated groove in each of the inner and outer walls and after insertion said connective strut is positioned substantially flush with the top of the outer wall and the inner wall.
39. The connective structure of claim 31 wherein at least one connective strut further comprises a first member and a second member with edges joined substantially at a right angle to form an elongated strut.

40. The connective structure of claim 39 wherein the connective strut further comprises a third member, the third member joined with the first and second to form a strut with a channel-shaped cross-section.
41. The connective structure of claim 31, wherein at least one connective strut is formed from one or more of the group comprising a plastic, a metal or a metal alloy.
42. The connective structure of claim 31 wherein the connective structure is comprised of one or more of the group consisting of ABS plastic, polypropylene, rigid polymers, polyethylene, fiberglass, or molded fiberglass.
43. The connective structure of claim 31 wherein the connective structure has low energy conductance.
44. The connective structure of claim 43 wherein the connective structure is comprised of one or more of ABS plastic, polypropylene, polyethylene, rigid polymers, fiberglass, or molded fiberglass.
45. The connective structure of claim 31 wherein at least one connective strut further comprises at least one recess for receiving a structural enhancement.
47. The connective structure of claim 31 further comprising an insulating panel member supported on said struts in spaced parallel relation to one of said inner and outer wall to define a weep gap.
47. The connective structure of claim 31 further comprising an insulating panel member supported on said struts and having at least one spacer to separate the panel member from said outer wall to define a weep gap.

48. An insulating connective structure for use in a discrete, preassembled, composite modular block, comprising an outer wall and an inner wall, at least one of which is load bearing and made from a first material, said connective structure comprising:

a connective strut with a first wall runner at each of the first and second ends of the strut, each said wall runner having a pair of connectors thereon, said strut extending between and being connected to both the outer wall and the inner wall by the pair of connectors on each wall runner, such that the outer wall and the inner wall are securely positioned with respect to one another as opposite faces of a discrete rectangular block, said strut further being formed of a second material different from the first material;

and

a separate insulation panel mounted on and cooperating with said strut and extending parallel to at least one of the first and second walls, said panel being positioned by said connective structure to partition the space between the first and second walls.

49. The insulating connective structure of claim 48, wherein the insulation panel is mounted on said strut in spaced relation to one of said inner and outer wall to define a weep gap.

50. A retaining wall comprising a outer wall and a inner wall formed from a plurality of stacked composite blocks wherein one of the outer wall and the inner wall is in contact with a retained mass and made of a first material, each composite block having its own outer wall and the inner wall and being connected by a connective structure formed of a second material, said connective structure comprising extending between and being connected to both the outer wall and the inner wall of a block, such that the outer wall and the inner wall of each block are securely positioned with respect to one another as opposite faces of a discrete rectangular block, said connective structure.

51. The retaining wall of claim 50 wherein the connective structure comprises a partitioning panel positioned in spaced relation to the one of said inner and outer walls to define a weep gap for receiving and draining water from the retained mass.

52. The retaining wall of claim 51 wherein a portion of the connective structure extends between adjacent blocks to form a drain path for said water.

53. The retaining wall of claim 50 wherein a portion of the connective structure extends between adjacent blocks to provide a tie connection for a dead man placed in the retained mass.)
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